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## **Traballo de Fin de Máster**

**O impacto das técnicas de preactivación na aprendizaxe de sustantivos na L2: un estudo a través dun xogo competitivo en Lingua inglesa**

**El impacto de las técnicas de preactivación en el aprendizaje de substantivos en la L2: un estudio a través de un juego competitivo en Lengua inglesa**

**The impact of priming methods on L2 noun learning: A case study through a competitive game in ELT**

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## **Abstracts**

### **English**

This Master Thesis presents a pedagogical intervention for 1st level Baccalaureate students in a Spanish public secondary school, focusing on the use of game-based and priming methods to promote L2 noun learning in the ELT classroom. For this purpose, a series of pedagogical sessions were designed employing two primary learning conditions: priming together with game-based methods, and game-based methods alone. Then, students voluntarily participated in an online *Kahoot!* quiz to consolidate their knowledge through a competitive game. The quiz featured sentences with gaps and four possible answers, requiring students to select the only correct one. The quiz used two priming modalities: lexical priming with semantically-related words, and visual priming with pictures of the target word. Data from the *Kahoot!* quiz was analyzed to determine the impact of priming modalities on performance. These results were compared to students' later performance on a written test to assess the mid-term effects of the different learning conditions. The analyses revealed that combining priming techniques with game-based methods resulted in higher accuracy results in the written test compared to game-based methods alone. This indicates that priming techniques, alongside game-based methods, constitute an effective tool for teaching vocabulary in ELT 1st level Baccalaureate classrooms.

Key words: ELT, vocabulary, game-based learning, priming methods.

### **Galician**

Este Traballo de Fin de Mestrado presenta unha intervención pedagóxica para estudantes de 1º de Bacharelato nun instituto público español centrada no uso de xogos e técnicas de preactivación para facilitar a aprendizaxe de substantivos na aula de inglés. Para iso, deseñáronse cinco sesións empregando dúas condicións de aprendizaxe: preactivación xunto con xogos, e só xogos. O alumnado participou voluntariamente nun cuestionario en liña para consolidar os seus coñecementos a través dun xogo competitivo. O cuestionario, que empregaba dúas modalidades de preactivación (léxica e visual), incluía frases con ocos e catro respostas posibles, e requiría que o alumnado seleccionasen a única correcta. Os datos do cuestionario foron analizados para determinar o impacto das modalidades de preactivación na aprendizaxe. Estes resultados comparáronse co rendemento posterior do alumnado nunha proba escrita para avaliar os efectos a medio prazo das diferentes condicións de aprendizaxe. As análises revelaron que a combinación de técnicas de preactivación con xogos resultaron nun maior nivel de acerto na proba escrita en comparación co emprego illado de xogos. Isto indica que as técnicas de

preactivación xunto coa aprendizaxe baseada en xogos constitúen unha ferramenta eficaz para ensinar vocabulario nas aulas de inglés para estudantes de 1º de Bacharelato.

Palabras clave: ensino do inglés, vocabulario, aprendizaxe baseado en xogos, preactivación.

## **Spanish**

Este Trabajo de Fin de Máster presenta una intervención pedagógica para estudiantes de 1º de Bachillerato en un instituto público español, centrada en el uso de juegos y técnicas de preactivación para facilitar el aprendizaje de sustantivos en la clase de inglés. Para ello, se diseñaron cinco sesiones empleando dos condiciones de aprendizaje: preactivación junto con juegos, y solo juegos. El alumnado participó voluntariamente en un cuestionario en línea para consolidar sus conocimientos a través de un juego competitivo. El cuestionario, que empleaba dos modalidades de preactivación (léxica y visual), incluía frases con huecos y cuatro respuestas posibles, requiriendo que el alumnado seleccionase la única correcta. Los datos del cuestionario fueron analizados para determinar el impacto de las modalidades de preactivación en el aprendizaje, y se compararon con el rendimiento posterior del alumnado en una prueba escrita. Los análisis revelaron que la combinación de técnicas de preactivación con juegos resultó en un mayor nivel de acierto en la prueba escrita en comparación con el uso aislado de juegos. Esto indica que las técnicas de preactivación, junto con el aprendizaje basado en juegos, constituyen una herramienta eficaz para enseñar vocabulario en las clases de inglés para estudiantes de 1º de Bachillerato.

Palabras clave: enseñanza del inglés, vocabulario, aprendizaje basado en juegos, preactivación.

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## List of Abbreviations

<b>CEFR</b>	Common European Framework of Reference
<b>ELT</b>	English Language Teaching
<b>SLA</b>	Second Language Acquisition

## **1. Introduction**

This Master Thesis presents a pedagogical intervention that was designed and implemented with 1<sup>st</sup> level Baccalaureate students belonging to a public secondary school in Spain. The study focused on the teaching and learning of vocabulary in the English Language Teaching (henceforth ELT) classroom. It includes a total of five pedagogical sessions, which were carried out with two different groups of students of this level. The study was supervised by the permanent teacher at the secondary school, and it met the curricular and timing requirements provided. This study had two main goals: (a) providing a pedagogical intervention that was appropriate to the curricular and timing requirements, as well as to the students' level of English, academic profiles and observed classroom dynamics; and (b) exploring the short-term and mid-term effectiveness of different methodologies employed throughout the sessions. Three main learning conditions were included in the study: (i) the use of game-based methods alongside lexical priming techniques; (ii) the use of game-based methods alongside visual priming techniques; and (iii) the use game-based methods in isolation. Both game-based methods and priming techniques were selected as methodologies due to the fact that they have been consistently linked to finding an increase in students' motivation and involvement in the tasks, as well as in students' learning experiences and outcomes (Altarriba & Knickerbocker, 2011; Huyen & Nga, 2003; Paul, 2003; Williams & Cheung, 2011; Wright, Betteridge & Buckby, 2006; Zhang, 2014). Several research questions and hypotheses were formulated and considered, and two research instruments were used to gather data relative to the students' response times and accuracy in different vocabulary tasks. This was done with the aim of contributing relevant pedagogical data to current discussions regarding the efficacy of different techniques and tools for teaching vocabulary in the ELT classroom.

The structure of this Master Thesis is as follows. Firstly, I will begin by exploring and reviewing relevant theoretical considerations and related experimental evidence in the teaching and learning of vocabulary in the ELT classroom. In this introduction I will also consider important questions regarding the use of game-based learning as an effective methodology in the teaching of L2 vocabulary, as well as the use of priming methods as a pedagogical tool in this context. Secondly, I will go over the present study in depth, tackling aspects such as objectives, research questions, hypotheses, methodology, procedure, research instruments, sessions and materials. Thirdly, I will describe how the gathered data was processed and analyzed. Fourthly, I will present the results of the statistical analyses of the data. Finally, I will present my conclusions and the pedagogical implications linked to my findings in order to address the research questions and hypotheses considered in the study.

## **1.1 Teaching and learning L2 vocabulary**

Vocabulary typically refers to a wide array of content words in a given language, including categories such as nouns, adjectives, adverbs and verbs. Vocabulary knowledge is often considered to be a critical component in the learning of a foreign language, since having a limited vocabulary can hinder the learner's performance in all language skills (Alqahtani, 2015; Nation, 2011; Schmitt, 2000). From a communicative approach, an adequate knowledge of vocabulary plays a key role in achieving successful communication due to the fact that this component of language is the main means through which the content of utterances is conveyed. Therefore, vocabulary knowledge may become more important than grammatical correctness in situations in which learners must prioritize getting their message across (Wilkins, 1972). Additionally, it should be noted that an increase in vocabulary knowledge often correlates with an increase in language use by language learners; this, in turn, leads to subsequent increases in the learner's vocabulary knowledge (Nation, 2001).

For all these reasons, designing and implementing effective vocabulary teaching programs is of paramount importance in all ELT context, including those corresponding to beginner and intermediate English courses available in secondary schools. In order to properly design and implement such programs, several theoretical considerations must be kept in mind so as to ensure efficient mid-term and long-term learning and retention on behalf of the language learners. These considerations revolve around several key points: (a) understanding how learners acquire vocabulary, (b) the nature of vocabulary knowledge itself, and (c) the strategies that best support vocabulary learning. In the following paragraphs, I will explore these theoretical foundations and their implications for L2 vocabulary teaching practices in ELT classrooms.

Firstly, it must be established that vocabulary knowledge does not correspond to a single-dimensional skill, but a complex and ever-changing ability that language learners must continue to develop throughout the whole language learning experience. In this regard, vocabulary knowledge can be conceived and gauged according to different criteria. On the one hand, the breadth of vocabulary knowledge refers to the estimated number of words that a language learner knows (Qian, 1999). In ELT, expanding the breadth of vocabulary knowledge is a crucial aspect of language teaching, as it forms the foundation for much of the learners' active and passive language use. On the other hand, the depth of vocabulary knowledge refers to how well a learner knows a given word (Qian, 1999). A deep understanding of vocabulary entails possessing a robust representation of several dimensions that make up knowledge of a word, including its possible meanings, nuances, collocations, morphological properties, syntactic roles, and pragmatic uses. For this reason, vocabulary teaching should aim not only to expand the number of known words

but also to deepen the understanding of each known word in order to provide language learners with all the necessary information to appropriately use the learned vocabulary. Designing adequate ELT programs that take these dimensions of vocabulary learning into account is a necessary aspect of successful vocabulary teaching, especially regarding the management of important resources such as time, range of language materials and the use of different methodologies.

The way in which vocabulary can be acquired during second language acquisition (henceforth SLA) is another key consideration that ELT programs must take into account. One of the most basic theoretical distinctions in this regard pertains to the two main possible types of learning in SLA, i.e., incidental learning and intentional learning (Day, Omura & Hiramatsu, 1991; Sinyashina, 2020). Incidental learning occurs when learners acquire vocabulary unintentionally while focusing on another task, such as reading or listening. By contrast, intentional learning involves deliberate efforts to learn vocabulary, such as using flashcards or vocabulary lists. In general, it is thought that incidental learning can help language learners improve their contextual understanding, while intentional learning is more effective in ensuring that specific vocabulary is targeted and covered systematically. Research suggests that even though both incidental and intentional learning are effective ways of teaching vocabulary on their own, a balanced approach where both methods are employed can be conducive to achieving the best results in SLA programs of varying durations, levels and target languages (Hulstijn, 2013; Nation, 2004; Schmitt, 2007; Sinyashina, 2020). Additionally, it should also be noted that the way in which the target vocabulary is presented to language learners has a great impact in its learnability. Stephen Krashen's Input Hypothesis (1982) holds that learners acquire language best when they are exposed to linguistic input that is slightly above their current proficiency level. In terms of vocabulary teaching, this implies that learners should be exposed to texts and spoken language that introduce new vocabulary in such a way that the stimuli are mostly understandable, in order to promote the integration of the target vocabulary into their language knowledge.

Effective vocabulary teaching must also incorporate various cognitive strategies which help learners acquire and retain new words. Some of these strategies include repetition and recycling, a technique in which language learners are repeatedly exposed to the target vocabulary in different contexts to help reinforce memory (Milton, 2009; Nation, 2001; Nation, 1994; Yang, 2022). Some scholars suggest that recycling vocabulary items through spaced repetition can provide the best results to aid in its long-term memory retention (Nation, 2001; Nation, 1994; Yang, 2022). One useful way in which this spaced repetition can be implemented in the classroom involves the use of flashcards containing the target vocabulary. These flashcards can be

introduced into spaced sessions throughout the ELT program that deal with the target vocabulary in different ways (i.e., varying contexts, tasks, exercises, etc.), so that learners can be exposed to a variety of linguistic experiences while processing the target vocabulary (Zhang & Lu, 2015). Association techniques are also a cognitive strategy known to facilitate vocabulary learning. It involves linking new words to known concepts, synonyms, or antonyms, as well as creating mental images which can enhance memory. For instance, one effective way of teaching the word *elated* can involve associating it with the higher-frequency word *happy* while displaying a joyful picture. These association techniques typically produce priming effects, a well-known cognitive response that arises in processing when one initial stimulus (i.e., the *prime*) preactivates the recognition or retrieval of another related stimulus (i.e., the target) in the learner's mind. In this manner, the presentation of the known word *happy* as well as the display of a joyful picture preactivate such representations in the learner's mind, which are then associated to the target word *elated*. This processing effect facilitates the retention of those characteristics that make up the word's meaning in both short-term and long-term memory, which in turn impact the robustness of the lexical representation of the word (Altarriba & Knickerbocker, 2011; Trofimovich & McDonough, 2011). For a broader discussion on the facilitatory effects of association techniques, see section 1.3. Lastly, presenting vocabulary in meaningful contexts rather than in isolation has been shown to help language learners understand, retrieve and recall the target vocabulary more effectively (Fisher & Frey, 2008; Tuyen & Huyen, 2019; van den Broek, Wesseling, Huijssen, Lettink & van Gog, 2022). For this reason, scholars strongly recommend using contextual learning in the teaching of vocabulary by means of reading passages, dialogues, and situational role-plays (Fisher & Frey, 2008; Nation, 1994).

Finally, attending to affective factors such as motivation, attitude, self-esteem and anxiety significantly influences the success of vocabulary learning. Theories such as Krashen's Affective Filter Hypothesis (1982) suggest that a low-anxiety environment, high self-esteem and high motivation levels on behalf of the learners facilitate all aspects of SLA. Important measures to put into practice in order to attend to these variables include creating a positive learning environment in the classroom, where learners should feel supported academically as well as comfortable with making mistakes and taking risks in the language learning experience. Teachers should also use positive reinforcement and encouragement, as these are effective ways to boost learners' confidence and motivation. Additionally, it is important to connect vocabulary teaching to the language learners' interests and real-life needs in order to promote their motivation and personal implication in the learning process. This is because realizing how relevant the acquired words are

in their own lives makes learners more likely to be motivated to learn and remember them (Neugebauer, Ellis & Coyne, 2021).

All in all, effective vocabulary teaching in ELT requires a nuanced understanding of the nature of vocabulary knowledge, theories of vocabulary acquisition, cognitive strategies, and affective factors involved in the language learning process. By considering these theoretical foundations, teachers can appropriately design vocabulary teaching programs that are comprehensive, engaging, and effective. This holistic approach ensures that learners not only acquire a wide range of vocabulary, but also develop a deep understanding and ability to use new words in meaningful communication. However, further methodological considerations can also be put into practice in order to expand our understanding and application of effective ways of teaching any language component in SLA, including vocabulary. For that reason, in the following section I will explore the impact of game-based learning as an advantageous technique to teach vocabulary in the ELT classroom.

## **1.2 Game-based learning in the ELT classroom**

During the last few decades, game-based learning has become an increasingly popular teaching method in which many aspects of ELT can be effectively targeted, including vocabulary. Game-based learning is an educational approach in which both digital and non-digital games are employed as the basic pedagogical tools involved in learning (Kingsley & Grabner-Hagen, 2017; Panmei & Waluyo, 2023). In this manner, game-based learning situates games at the very center of the learning experience in the ELT classroom, exploiting the engaging and interactive nature of games as the main vehicle to create an immersive learning environment. The application of game-based learning began during the last half of the 20<sup>th</sup> century, when it primarily relied on the use of non-digital games, such as board games, puzzles, and other manipulatives (Pivec, 2007). As computers and other digital advancements became increasingly available in educational settings, digital games also emerged as a new vehicle for implementing game-based learning in the ELT classroom, which accounts for its current popularity. In order to effectively use game-based learning in vocabulary instruction, it is essential to consider and apply several questions, including potential benefits, relevant factors and theoretical principles, which I will explore in the following paragraphs.

In the last few decades, some experimental evidence has been presented suggesting the existence of a positive effect of game-based learning on building various cognitive and non-cognitive competencies of students in higher education (Chen & Law, 2016; Clark, Nelson, Sengupta & Angelo, 2009; Papastergiou, 2009; Qian & Clark, 2016; Vogel, Greenwood-Ericksen, Cannon-Bowers & Bowers, 2006). Due to the potential benefits that this methodology has to offer,

many ELT specialists have recommended the use of game-based learning in ELT educational contexts. Some of the advantages that have been associated with game-based methods revolve around the creation of an engaging and supportive learning environment in which students can interact and have pleasant and enjoyable experiences while dealing with contents in the foreign language (Celce-Murcia, 2001; Paul, 2003; Wright, Betteridge & Buckby, 2006). In turn, such environments foster the maintenance of a communicative flow among all social agents implicated in the SLA learning process, which increases the efficacy of the intervention (Celce-Murcia, 2001; Wright, Betteridge & Buckby, 2006). This is because promoting the meaningful use of social language is an integral aspect of the SLA process (Celce-Murcia, 2001). Using games in the ELT classroom can also become an efficient way of bringing language learners closer to real-life situations in which they can practice spontaneous language use in the foreign language; this is due, in part, to the task-oriented nature of most games (Celce-Murcia & McIntosh, 1979). Regarding the affective variables tackled in section 1.1, game-based methods have been found to increase motivation, reduce anxiety levels in the classroom and promote collaboration among students, all favorable outcomes according to the Affective Filter Hypothesis (Huyen & Nga, 2003; Krashen, 1982; Uberman, 1998). Finally, this methodology also facilitates the practice and development of more than one language skill simultaneously, especially when compared to more traditional methods. For all these reasons, it is widely recommended as an effective way of teaching vocabulary as it promotes vocabulary retention and student engagement with the language contents (Nation, 2001).

Importantly, it should be noted that the theoretical foundations that underpin the use of game-based learning are also present in the formulation of several cognitive principles that are relevant to current pedagogical guidelines and recommendations. For example, constructivist theories posit that learners build new knowledge by connecting it to existing knowledge through active engagement. As such, it is widely recommended for educators to encourage students to analyze the reviewed contents, apply the learnt strategies and otherwise actively participate in the learning process (Marlowe & Page, 2005). In the context of game-based methods and vocabulary teaching, games provide an excellent medium to promote the application of these constructivist principles. This is partly due to the fact that games strongly rely on meaningful interaction in order to operate, which helps learners construct their understanding of new words through contextual learning (when vocabulary is placed in context) and experiential learning (by means of active participation, which reinforces retention and recall of target items (Nation, 2001)). Parallel to this, game-based learning attends to several factors that are key in the maintenance of learner motivation, including autonomy, competence, and relatedness. Games can address these factors

by (a) allowing learners to make choices within the game; (b) providing feedback and challenges that are matched to the learners' skill levels, ensuring a sense of accomplishment and progress; and (c) creating opportunities for social interaction and collaboration within the game, fostering a sense of community and support among learners. It should be noted that the aforementioned factors are some of the most relevant variables in the promotion of human motivation and psychological wellness (Ryan & Deci, 2017). Lastly, the importance of social interaction and cultural engagement is also emphasized in Vygotsky's Sociocultural Theory (1978), especially regarding the development of speech and other language abilities. Game-based learning can incorporate these elements into ELT environments due to the fact that it promotes collaborative learning, encouraging language learners to practice vocabulary together, negotiate meanings, and support each other's learning.

When applying a game-based methodology, several practical implementation strategies should be taken into consideration. Firstly, teachers should attempt to strike a reasonable balance between the complexity of the tasks and the learners' capacity to process information. After all, using games that are too complex can run the risk of overwhelming learners, while those that are too simple may not be engaging or challenging enough to motivate them. Secondly, it is also important to set clear goals before and during the game-based activities. After the tasks are finished, mechanisms for assessing vocabulary acquisition and providing feedback should also be incorporated in order to help learners track their progress and identify areas for improvement. Scaffolding is another relevant consideration to put into practice while applying a game-based methodology; this is an instructional practice by which a teacher gradually removes guidance and support as students learn and become more competent. This can help learners adequately progress from their current level to higher levels of language knowledge and skill. To maximize the effectiveness of game-based learning in vocabulary teaching, it is crucial to align games with specific learning objectives in the curriculum, thus ensuring that the vocabulary targeted in games is aligned with the students' learning goals. Attending to diversity and the learners' specific educational needs is also an important aspect of game-based learning. In this regard, game-based activities should incorporate vocabulary that is relevant to the learners' needs and contexts as much as possible. Tasks should be easy to engage in and accessible to all learners, thus observing their varying levels of language knowledge and technological proficiency. Finally, teachers should adopt a complex and multifaceted role when applying a game-based methodology. This includes acting as facilitators, who guide learners through the game, provide support when needed, and ensure that learning objectives are being met. Additionally, teachers should continuously monitor learners' progress and assess their vocabulary acquisition, adapting games or instructional

strategies as necessary. Lastly, it is also important to promote self-reflection by encouraging learners to discuss their experiences, the target vocabulary, and how it was used in the game.

To sum up, utilizing game-based methods for vocabulary teaching in ELT contexts necessarily involves a comprehensive understanding of various theoretical and practical considerations. If done properly, educators can effectively harness the potential of game-based learning to enhance vocabulary acquisition and create a dynamic and engaging learning environment that may suit young language learners in SLA environments. However, it should be noted that game-based learning need not be used in isolation, as this method can indeed be paired with other teaching techniques in order to further increase the likelihood of effective vocabulary teaching. In the following section I will explore the potential of priming methods as another pedagogical tool that can positively impact the learning of vocabulary in the ELT classroom. As advanced above, both of these methods (i.e., game-based learning and priming techniques) will be employed separately and in conjunction in the present pedagogical intervention in order to promote vocabulary learning and explore the efficacy of these methods in short-term and mid-term L2 vocabulary retention.

### **1.3 Priming methods as a pedagogical tool**

In the last few decades, there has been an increasing interest in psycholinguistic research investigating the cognitive foundations of language learning, with a special focus on the experimental paradigms and techniques that have been found to facilitate SLA. Priming methods comprise one such well-established paradigm, which has been widely employed to explore the underlying cognition supporting language learning and use. In language processing, priming refers to a phenomenon in which previous exposure to a stimulus affects a speaker's subsequent language processing, both in comprehension and production. For example, it has been found that presenting the word *hospital* facilitates the subsequent processing of the word *nurse* immediately after, an effect which is known as lexical priming. More specifically, reading studies show that language users read the target word *nurse* more quickly and/or retrieve its meaning more accurately after reading a related prime (i.e., *hospital*) than after reading an unrelated word (e.g., *brick*) (Trofimovich & McDonough, 2011; Wagner & Koutstaal, 2002). Similarly, cross-modal lexical decision tasks and eye-tracking studies show that participants process a target word such as *nurse* more quickly and/or accurately after visualizing a related visual prime (i.e., a depiction of a hospital) than after visualizing a picture of an unrelated concept (i.e., a depiction of a brick) (Lam, Dijkstra & Rueschemeyer, 2015).

Priming phenomena such as these are thought to reveal how language users access and manage their lexicon, which is why they have been essential in the study of semantic network

organization in the mental lexicon of both first and second language speakers (see Altarriba & Basnight-Brown, 2007, for a thorough review of this literature). Priming effects comprise one of the most widely reported and robust phenomena observed in psycholinguistic research; this, together with the fact that other cognitive abilities besides language can be primed, suggests that priming effects stem from core aspects in human cognition rather than it constituting language-dependent phenomena (Trofimovich & McDonough, 2011). As a cognitive effect, priming is also considered an implicit psychological phenomenon, since it requires little or no awareness on behalf of the language user to occur. As such, language-related priming can be conceived as a form of implicit learning, by which previous language experiences influence subsequent language use, thus becoming a continuous learning process throughout the lifespan of a language user for as long as language skills are retained (Trofimovich & McDonough, 2011). Additionally, SLA findings suggest that new words are learned in an episodic fashion, that is, not simply inheriting the direct translation meaning from the L1 equivalent, but rather being associated with the aspects of meaning that were active at the time the new words were presented (Williams & Cheung, 2011). Taken together, these considerations highlight the importance of shedding light on priming methods as an effective pedagogical tool with great potential for positively impacting SLA in ELT environments.

Different types of priming effects have been reported in experimental research depending on which language component is involved and/or the nature of the prime stimulus itself. Among these, lexical priming and visual priming are to be highlighted due to their facilitatory effects in expanding mental lexicon representations and vocabulary (Altarriba & Knickerbocker, 2011; McDonough & Trofimovich, 2008). This SLA research in psycholinguistics is closely related to the application of associative learning in pedagogical contexts, especially in vocabulary learning (Williams & Cheung, 2011; Zhang, 2014). Associative learning is a methodology commonly employed in SLA educational environments by which language learners are exposed to vocabulary items and related stimuli at the same time (Zakeri & Khatibi, 2014). It has been proposed as an appropriate technique and more natural approach than the traditional direct-translation method for helping learners map words to their meanings, as it only requires learners the ability to form associations between stimuli (Burns, Sutton, Morrison & Cohen, P., 2003). Associative learning can be classified into three categories: (a) association by contiguity, (b) association by similarity, and (c) association by contrast (Richards & Schmidt, 2002). The first is an example of a typical lexical and/or visual priming paradigm, as it involves presenting target words (i.e., the target vocabulary) temporally close to the presentation of the prime stimuli (i.e., strongly-related words or visual depictions). It is, therefore, not surprising that associative learning

is found to correlate with better vocabulary learning performance (Williams & Cheung, 2011; Zhang, 2014).

For the reasons explained above, lexical priming, visual priming and game-based methods were selected as relevant methodological tools to promote the learning of the target vocabulary. In the following sections I will explore the impact of these methods, combined or in isolation, on L2 noun learning in the ELT classroom by laying out the main characteristics of the present study.

## **2. Present study**

This Master Thesis presents a pedagogical intervention designed for and carried out with two groups of students belonging to 1<sup>st</sup> level Baccalaureate studies in a public secondary school in Galicia, Spain. The proposal revolves around the teaching and learning of L2 nouns within the context of the ELT classroom. In this secondary school English is a mandatory course taken by students during the whole school year, with a schedule corresponding to triweekly 50-minute sessions. The target vocabulary in this study was explored in five sessions by means of game-based methods, lexical priming and visual priming techniques, thus involving three different learning conditions for the explored vocabulary: (a) lexical priming and game-based methods, (b) visual priming and game-based methods, and (c) game-based methods. These methods were selected with the aim of facilitating and promoting the learning of the target items (see sections 1.2 and 1.3 for a review on the effectiveness and usefulness of these methodological tools). It is worth noting that this intervention was part of a larger Unit of Work entitled *Extreme Nature*, which corresponded with the sixth unit in the school year for students of this level in this secondary school. For this reason, this proposal was designed to meet the curricular and timing requirements provided by the permanent teacher who supervised this study. As a consequence, all target vocabulary items explored in this intervention were selected from the available vocabulary in the *Extreme Nature* unit of the English course textbook *Burlington Mindselt for Bachillerato 1* (Grant & Edwards, 2020).

### **2.1 Objectives**

This study was designed and implemented with two main objectives in mind. On the one hand, I aimed to propose a pedagogical intervention for L2 noun teaching and learning that would be generally suitable for students of 1<sup>st</sup> level Baccalaureate studies in the ELT classroom, and also especially appropriate for the two groups of students in which this intervention was carried out. Thus, I attempted to create a proposal that was not only educational, but also motivating and enjoyable for the students. For this reason, I devoted special attention and importance to the methodological considerations taken here. On the other hand, I also aimed to design a

pedagogical study with which to gather data regarding the effectiveness of different methodological tools in the teaching and learning of L2 nouns in the ELT classroom. To this end, I designed and employed an online competitive quiz hosted in the *Kahoot!* platform (Versvik, Brand & Brooker, 2012) to collect measures reflecting the response times and accuracy of target vocabulary selection in a multiple-choice task (see section 2.5 for a full account of the *Kahoot!* questionnaire as a research instrument). Additionally, I also gathered accuracy data from a written test performed at the end of the intervention, which evaluated students' knowledge of the vocabulary explored in the unit (see section 2.5 for a full account of the written test as a research instrument). The collected data was gathered with the goal of addressing and answering the research questions considered in this study, which are stated in the section that follows.

## **2.2 Research questions and hypotheses**

As advanced above, three different learning conditions were employed to explore the target vocabulary throughout the sessions: (a) lexical priming and game-based methods, (b) visual priming and game-based methods, and (c) game-based methods. These conditions are summarized in Table 9 of Appendix A. Related to this, I formulated two main research questions (henceforth RQ1 and RQ2) regarding the use of different learning conditions in the exploration of the target vocabulary:

- RQ1. Do priming techniques paired with game-based methods (Conditions A and B) facilitate the short-term and mid-term learning of L2 nouns when compared to game-based methods alone (Condition C)?
- RQ2. If so, does any specific modality of priming (i.e., Condition A or B) facilitate L2 noun learning to a greater degree, or are they equally effective in facilitating short-term and mid-term L2 noun learning?

In line with the previous literature discussed in section 1, I contemplated three different hypotheses (henceforth H1-H3) in relation to the results obtained in this study; these encompass possible and plausible answers to my main research questions above:

- H1. By the end of the pedagogical intervention, no particular learning condition will be correlated with higher accuracy values in the written test results, thus suggesting that all teaching techniques were equally effective in the short-term and mid-term learning of L2 nouns.
- H2. By the end of the pedagogical intervention, vocabulary items that have been taught through priming techniques (i.e., visual and lexical priming) paired with game-based methods will show higher accuracy values in the written test results compared to those items that have not been taught through priming techniques (Condition C), thus

suggesting that priming techniques were more effective in short-term and mid-term L2 noun learning than game-based methods alone.

- H3. By the end of the pedagogical intervention, vocabulary items that have been taught through a specific modality of priming (i.e., visual or lexical) will show higher accuracy values in the written test results compared to those items that have been taught through the other modality of priming, thus suggesting that one modality of priming was more effective in short-term and mid-term L2 noun learning than the other.

### **2.3 Participants**

This pedagogical intervention was carried out with two different groups (groups A and B) of students belonging to 1<sup>st</sup> level Baccalaureate studies in a public high school in Galicia, Spain. Both groups were selected as recipients of this intervention due to the fact that their observed classroom dynamics and student profiles were very similar. For example, both classes accommodated around 25 students (group A: females = 9, males = 13; group B: females = 11, males = 14) between the ages of 16 and 18. Importantly, classroom dynamics and students' profiles played an essential role in the design choices and methodological considerations taken in this pedagogical intervention, which was made possible by the fact that I had the opportunity of observing both groups during a period of four weeks prior to the moment of conducting the study.

During this observation period, I attended each group's lessons three times a week, which provided me with a total of 12 sessions per group to analyze their classroom dynamics, students' profiles and general levels of involvement, motivation and participation in the classes. Lessons were carried out by the permanent teacher, and relied heavily on the use of the English course textbook, *Burlington Mindselt for Bachillerato 1* (Grant & Edwards, 2020). During my observations, students from both groups consistently performed as highly active and talkative pupils, and they also displayed a general tendency to struggle with maintaining short-term and mid-term attention on the proposed tasks. Students from group A also struggled with showing a satisfactory level of personal involvement with respect to the lessons, which in turn translated into low participation indexes and seemingly low motivation. By contrast, students from group B did not struggle with actively participating in the lessons and generally demonstrated eagerness and excitement to become personally involved in the classes. Taking these observations into account, and in order to address and meet the educational needs of all students, I designed a pedagogical intervention centered around the teaching and learning of L2 nouns that also promoted students' engagement, motivation, and management of short-term and mid-term attention on the classroom activities.

## 2.4 Methodology

Taking the above observations into account, I relied on a number of methodological considerations to achieve my goals. Firstly, a communicative approach was used throughout the sessions (Duff, 2014), which meant that I strongly prioritized the use of English as a communicative tool rather than as part of a school subject. During the sessions, I used English almost exclusively to speak with the students, only resorting to other languages (i.e., Spanish or Galician) when communication became seriously impaired and could not be achieved by any other means (e.g., repetition, drawings, use of props and other physical resources, facial expressions, pointing or hand gestures). Lessons centered around the creation of motivating and attainable social contexts for the students by means of engaging in cooperative or competitive games. The use of games in almost every session of the intervention was intended to promote student's involvement, motivation and participation in the learning process. In relation to this, active participation and use of the English language on behalf of the students was highly promoted during the sessions, as students were encouraged to position themselves as active speakers with the power to actively enrich the learning process. For this purpose, I routinely and explicitly promoted students' active participation, asking them to repeat their questions or comments back to me in English or otherwise engaging them, however and whenever possible and appropriate during the sessions. For these reasons, this pedagogical intervention complies with the basic methodological recommendations proposed by the Common European Framework of Reference (henceforth CEFR; 2001, 2020) for the teaching of foreign languages.

As advanced above, the use of game-based methods comprises another key methodological aspect of this intervention. On the one hand, the use of games was intended as a means to generally increase the motivation and personal involvement of students by providing motivating social contexts in which to compete or cooperate with other classmates while using English. On the other hand, game-based learning is widely reported as a useful tool to increase student's attention on the proposed tasks, which in turn helps to improve the efficacy and durability of learning (see section 1.2 for a full review of the relevant literature). Both digital and non-digital games were employed in this intervention, although the vast majority of the activities were non-digital games involving manipulatives due to the higher availability of these materials during the design process. Games were played mostly in small groups or pairs, thus incentivizing collaborative as well as competitive relationships among students, which were intended to increase motivation and engagement with the language contents. Besides game-based methods, priming techniques were also used in the sessions due to their pedagogical potential in SLA in ELT environments, as evidence shows that visual and lexical priming can facilitate the retrieval,

recognition and overall learning of L2 vocabulary items (see section 1.3 for a full review of the relevant literature). A complete list of the target vocabulary items in relation to their primary learning condition can be found in Table 10 of Appendix A.

Sessions were designed to include both incidental and intentional learning opportunities in the exploration of the target vocabulary. This was done in order to provide the best possible educational environment for students to perform the tasks, as experimental evidence suggests that including both incidental and intentional learning conditions can offer the most benefits in ELT classrooms (Nation, 2004; Schmitt, 2007; Hulstijn, 2013; Sinyashina, 2020). However, it should be noted that intentional learning was strongly favored in the design of this intervention due to the fact that the sessions rely heavily on the use of games and other competitive or cooperative activities in which the exploration of the target vocabulary was framed as explicitly intentional. Given the time limitations of this pedagogical intervention, sessions were designed mainly to expand the students' breadth of vocabulary related to nature, wildlife and the environment, relegated the development of the depth of that vocabulary to a secondary plane. Related to this, sessions aimed to incorporate the principles of recycling and spaced repetition discussed in section 1.1, although the intervention's limited duration (i.e., six weeks) greatly constricted the application of these pedagogical recommendations.

Finally, it was also important to me that I took some of the affective variables involved in the learning process into consideration while carrying out this pedagogical intervention, with a special focus on motivation, anxiety and (academic) self-esteem. Attending to these affective variables was an essential aspect of the application of this methodological intervention, since an appropriate management of these factors has been shown to play a facilitative role in second language acquisition (Krashen, 1986; Arnold, 2020; Horwitz, Horwitz & Cope, 1986). In this vein, I sought out to create a low-anxiety environment within the classroom on a daily basis by consistently positioning myself as an approachable teacher who values effort and attitude over accuracy. This is because high levels of anxiety can hinder performance and reduce the willingness to participate in classroom activities, while low levels of anxiety can promote involvement and participation, thus helping students achieve better learning experiences and outcomes (Arnold, 2020; Horwitz, Horwitz & Cope, 1986). In general, I also tried to foster a good relationship between the students and their academic self-esteem, since learners with higher self-esteem are more likely to take risks, participate actively, and engage more fully in the learning process (Arnold, 2020; Horwitz, Horwitz & Cope, 1986). During the sessions, I specifically engaged with those students that seemed to struggle in this regard and tried to reassure them by addressing their immediate needs or concerns (e.g., commenting on their progress,

complimenting them on their performance, offering help one-on-one rather than in front of the class, etc.). It was also important to me to set students up for success as much as possible, so that they would feel that the tasks at hand were manageable and attainable, which in turn would promote their involvement and make their individual progress more transparent to them. Some of the measures I took to this end included: (a) managing the classroom and setting the correct tone before beginning the sessions and activities; (b) giving clear and easy-to-follow instructions, repeating them and breaking them down further if needed, before beginning each task; (c) stating my own expectations of the students' performance and behavior clearly before beginning each task; (d) checking that the students' attention was on me and on the task at hand before moving on to the next step; and (e) regulating myself as the first step whenever I encountered some difficulty, after which I attempted to address the issue as quickly and efficiently as possible.

## **2.5 Procedure and research instruments**

As mentioned above, this pedagogical intervention revolves around the learning and teaching of English vocabulary, for which a total of five sessions were designed and implemented with two different groups of 1<sup>st</sup> level Baccalaureate studies students. These sessions are also part of a larger Unit of Work entitled *Extreme Nature*, which corresponds to the sixth Unit of Work in the English school subject for students of this level at this particular secondary school. In order to comply with the curricular and timing instructions provided by the permanent teacher, the five sessions in this pedagogical intervention were not carried out consecutively, but were alternated with other pedagogical sessions in the Unit that did not revolve around the teaching of vocabulary items. For this reason, this pedagogical intervention was completed over the course of six weeks, despite it containing only five sessions itself.

In order to address the research questions and hypotheses explored in section 2.2, I made use of two different research instruments to gather measures relative to the students' learning of the target nouns. One such instrument was an online *Kahoot!* quiz, which was presented as a competitive game for students to test their knowledge of the reviewed vocabulary items while competing against their classmates. This questionnaire contained 14 gapped sentences, which were presented one at a time and in a randomized fashion according to the randomization settings available in the *Kahoot!* platform (Versvik, Brand & Brooker, 2012). Each gapped sentence was visualized for 10 seconds, after which four possible answers to fill in the gap were shown below it. Students were previously instructed to pick the only grammatically and semantically option out of four possible answers to fill in the gap. Importantly, half of the gapped sentences contained a word that was strongly related to the target noun semantically (e.g., lexical prime *morning* related to the target *dawn*). A lexical priming effect was expected to arise in these instances, by which the

semantically related item facilitated the selection of the correct answer, i.e., the target word. By contrast, the other half of the gapped sentences did not contain words that were strongly related to the target noun semantically, but were accompanied by a picture that depicted the target word (e.g., visual prime depicting a shark related to the target *shark*). A visual priming effect was expected to arise in these instances, by which the visual representation of the item facilitated the selection of the correct answer, i.e., the target word. It is important to note that the presentation of visual primes occurred simultaneously to the presentation of the four possible answers (i.e., after a 10-second visualization of the gapped sentence). A complete list of the *Kahoot!* quiz can be found in Table 11 of Appendix A.

In order to participate in the *Kahoot!* questionnaire, students were properly informed of the procedure, participant rights, data treatment and other relevant questions included in the informed consent paperwork. Students were also informed that their participation was completely voluntary and altruistic, for which they would receive no compensation. Before participating in the *Kahoot!* quiz, students filled out and signed the informed consent paperwork, after which they were assigned an anonymous individual code consisting of the letter *s* and a two-digit number (e.g., *s00*). A total of 39 students belonging to groups A and B consented to participate in the study. To log into the online questionnaire, students who had been assigned an individual code were asked to enter this code into the platform to identify themselves in order to preserve their anonymity during the procedure, data processing and data analysis. After data collection, response times and accuracy per item and participant were the relevant measures from the *Kahoot!* quiz that were included in the analysis.

The second research instrument used in this pedagogical intervention consists of a written test, which also evaluated other linguistic competences besides vocabulary, such as grammar and reading comprehension. The contents of this written test met the requirements established by the permanent teacher; however, only the exercises pertaining to vocabulary are included in this Master Thesis. The vocabulary section of this written test contains two different exercises. The first is a fill-in-the-gap exercise with ten sentences; twelve vocabulary items are provided in a box at the top, which students had to use to fill in the gaps. In total, there were twelve gaps and twelve vocabulary items, which means that there were no extra items that did not need to be used. The second exercise included three items for which students had to indicate the plural form. Importantly, these vocabulary exercises included items that corresponded to all three teaching and learning conditions employed during the pedagogical sessions: four items (*jellyfish*, *dawn*, *poacher* and *peak*) were mainly taught using game-based methods and lexical priming techniques; four items (*soil*, *shark*, *mice* and *wildlife*) were mainly taught using game-based

methods and visual priming techniques; and four items (*tidal wave, reef, land* and *species*) were mainly taught using game-based methods alone (see Table 10 of Appendix A for a complete list of the target L2 nouns). The purpose of this written test was to explore whether the successful learning of vocabulary items was impacted by the specific modality of teaching, i.e., the three conditions outlined above. For this purpose, I included accuracy of participants' responses as the relevant measure in the analysis for this research instrument. The vocabulary section of this written test can be found in Figure 16 of Appendix C.

Finally, it should be noted that the research described here complies with the ethical recommendations provided by the Ethical Committee belonging to the Faculty of Education Science in the University of Santiago de Compostela (USC). Ethical recommendations and considerations taken in this intervention include: (a) the creation of informed consent paperwork that contains important information relative to the participation, data collection, data protection and data treatment in this intervention; (b) following the ethical guidelines provided by the USC Ethical Committee to properly inform participants, anonymize, protect and safeguard participants' data, and otherwise observe participants' rights during every stage of this intervention. The document showing the Ethical Committee's approval of this pedagogical intervention, as well as the informed consent paperwork used and general guidelines for conducting research observed here and provided by the University of Santiago de Compostela can be found in Figures 17-19 of Appendix C.

## **2.6 Sessions and materials**

This section contains a detailed layout of the sessions, sequence of activities, materials and resources used during this pedagogical intervention. The first four sessions (Tables 1-4) centered around the use of games and other short tasks that required students to socialize, cooperate, compete or otherwise share information with other classmates; the fifth and last session (Table 5) consisted on carrying out a written test to evaluate some of the students' language skills for the *Extreme Nature* unit. Some of these games also involved the use of visual or lexical priming techniques. For example, the game *Taboo* in session 1 required students to describe a vocabulary item without using said item or the taboo words indicated in the card (e.g., to describe *peak*, the student cannot use the word *peak* or taboo words such as *valley, top, high*). This kind of game provides a way to establish meaningful connections between related lexical items in such a way it promotes the recognition, retrieval and overall learning of the L2 items due to the facilitatory effect of lexical priming. Other tasks involved the use of visual priming techniques, such as *Guess the Word* in session 3. This game required students to write the word that best describes a picture shown on a small whiteboard (e.g., students were shown a picture of a shark and expected to

write *shark*). This kind of task provides a way for students to establish meaningful connections between lexical items and their related visual representations, which promotes the recognition, retrieval and overall learning of the L2 items due to the facilitatory effect of visual priming. By contrast, other tasks such as the *Architect* game in session 4 did not involve the use of lexical or visual priming techniques to promote the learning of L2 nouns. This game required students to create full sentences in small teams by using flashcards with nouns, verbs, functors and other available sentence constituents written on them. The only session in which no form of game was used was the last session, devoted exclusively to the written test.

Sessions were 50 minutes long and took place in a classroom equipped with a computer, touchscreen, speakers and a blackboard. Apart from the English course textbook, i.e., *Burlington Mindselt for Bachillerato 1* (Grant & Edwards, 2020), the materials used during the sessions included online resources, such as interactive matching games, as well as physical materials, such as flashcards, both of my own design and creation. Online resources are referenced in the corresponding tables by means of a link, while physical materials are illustrated by means of images provided in Figures 4-15 of Appendix B and Figure 16 of Appendix C.

As stated above, this pedagogical intervention centers around the teaching and learning of English nouns by means of priming techniques and game-based methods. The selection of the target English nouns in this intervention was constricted by the curriculum requirements provided by the permanent teacher. As a result, all target vocabulary items were selected from the available vocabulary in unit 6 *Extreme Nature* of the English course textbook *Burlington Mindselt for Bachillerato 1* (Grant & Edwards, 2020); apart from these target items, other English language contents were also addressed throughout the sessions, although these were not tested in the research instruments of this Master Thesis. A complete list of the target English nouns that were explored throughout the sessions can be found in Table 10 of Appendix A, together with a correspondence of their main learning condition (i.e., lexical priming and game-based methods, visual priming and game-based methods, game-based methods). The following Tables (1-5) illustrate a detailed sequence of activities in each session.

**Table 1***Sequence of activities in session 1*

<b>SESSION 1</b>			
<b>Time</b>	<b>Activity</b>	<b>Materials</b>	<b>Contents</b>
5'	<ul style="list-style-type: none"> <li>- Greet students and introduce myself as the temporary teacher.</li> <li>- Introduce the general topic of the sessions: learning English vocabulary from the <i>Extreme Nature</i> unit in their textbooks.</li> </ul>	-	-
15'	<ul style="list-style-type: none"> <li>- Guide students in a matching game that consists of matching words to their descriptions using the touchscreen.</li> <li>- Encourage students to talk among themselves and raise their hands to provide the appropriate matches between words and descriptions.</li> </ul>	computer, touchscreen, Wordwall activity < <a href="https://wordwall.net/resource/70862781">https://wordwall.net/resource/70862781</a> >	prey, predator, heat, cold, sunset, dawn, peak, valley, rare, common, rise, fall, quiet, noisy
12'	<ul style="list-style-type: none"> <li>- Guide students in the creation of pairs of opposites using the terms in the Wordwall activity.</li> <li>- In pairs, students work to create at least 3 sentences that use these pairs of opposites.</li> <li>- Encourage active participation from students to read their sentences.</li> </ul>	computer, touchscreen, Wordwall activity < <a href="https://wordwall.net/resource/70862781">https://wordwall.net/resource/70862781</a> >	prey - predator heat - cold sunset - dawn peak - valley rare - common rise - fall quiet - noisy

SESSION 1			
Time	Activity	Materials	Contents
15'	<ul style="list-style-type: none"> <li>- Form small groups of 4-5 students and explain the instructions of the game <i>Taboo</i>: students must take turns to describe a vocabulary item without using neither the target word nor taboo words included in the card (e.g. to describe <i>peak</i>, the taboo words included <i>valley, top, high</i>). The other team members must try to guess the target word as quickly as possible.</li> <li>- After checking that the instructions have been understood, hand out the Taboo cards, and guide and assist the students as they play.</li> </ul>	Taboo cards (Figure 4)	prey, predator, heat, cold, sunset, dawn, peak, valley, rare, common, rise, fall, quiet, noisy
3'	<ul style="list-style-type: none"> <li>- Collect the Taboo cards, ask for questions, resolve possible issues and thank students for their participation.</li> </ul>	-	-

**Table 2**

*Sequence of activities in session 2*

SESSION 2			
Time	Activity	Materials	Contents
3'	<ul style="list-style-type: none"> <li>- Greet students and introduce the session's topic: learning and talking about ugly, fierce and deadly animals.</li> <li>- Check understanding of these adjectives and use examples, translation and/or mimic to illustrate their meaning.</li> </ul>	-	ugly, fierce, deadly

SESSION 2			
Time	Activity	Materials	Contents
10'	<ul style="list-style-type: none"> <li>- Ask students to brainstorm animals that they dislike, and introduce these nouns into the Random Choice Generator.</li> <li>- Ask for a volunteer for a short speaking activity called the <i>Pet, Escape from, Keep</i> game, which consists of students indicating which animal they would rather pet, escape from or keep from a given selection of three animals.</li> <li>- Using the Random Choice Generator, draw a random selection of three animals and ask the volunteer to indicate their choices using the appropriate expression.</li> <li>- Ask for more volunteers to provide their answers with different selections of animals.</li> </ul>	computer, touchscreen, Random Choice Generator < <a href="https://www.gigacalculator.com/randomizers/random-choice-generator.php">https://www.gigacalculator.com/randomizers/random-choice-generator.php</a> >	Generally disliked animal names, and expressions of individual preference such as <i>I would...</i>
12'	<ul style="list-style-type: none"> <li>- Introduce the following activity: reading a text about a museum exhibition on ugly, fierce and deadly animals.</li> <li>- Ask individual students to read one sentence each out loud until the text is finished, stopping after each paragraph to check for understanding, provide a brief summary and resolve doubts.</li> <li>- When encountered, draw attention to irregular plurals, e.g., <i>mice, jellyfish, species</i>.</li> </ul>	Book p. 83 (Figure 6)	soil, poachers, species, jellyfish, orangutan, tiger, lion, polar bear, chimpanzee, shark, predator, cockroach, mice, rat, terrifying, put an end to, to begin with, play a vital role in, release

SESSION 2			
Time	Activity	Materials	Contents
10'	<ul style="list-style-type: none"> <li>- Divide the class into 5 teams and ask each team to complete one part of exercise 5, in which they must find words or expressions in the text that match the phrases given. Then, correct the exercise as a class.</li> </ul>	Book p. 82 (Figure 7)	soil, poachers, species, jellyfish, orangutans, tigers, lions, polar bears, chimpanzees, sharks, predator, cockroaches, mice, rats, terrifying, put an end to, to begin with, play a vital role in, release
12'	<ul style="list-style-type: none"> <li>- In the same groups, ask students to discuss which of the available animals they would like to encounter in nature and why, solving doubts and addressing issues as they come up.</li> <li>- Each group shares their opinion with the class using appropriate phrases.</li> </ul>	Book p. 83 (Figure 6)	jellyfish, orangutans, tigers, lions, polar bears, chimpanzees, sharks, cockroaches, mice, rats, expressions of collective preference such as We would like to...
3'	<ul style="list-style-type: none"> <li>- Ask for questions, resolves possible issues and thank students for their participation.</li> </ul>	-	-

**Table 3***Sequence of activities in session 3*

SESSION 3			
Time	Activity	Materials	Contents
3'	- Greet students and introduce the session's topic: playing several games to review and consolidate the learned vocabulary.	-	-
15'	- Divide the class in small teams and explain the rules of the game <i>Guess the Word</i> : students are shown a list of words at the beginning of the game, which they must check individually to make sure they know all the items; the teacher resolves any issues during this time. Afterwards, students are shown one image at a time on the screen and must decide which word of the initial list best describes the picture. In order to enter their response, teams must write their answer correctly on a small whiteboard. Only the team who enters the correct answer first scores points, which are tallied up on the board under each team. - Play the game <i>Guess the Word</i> following the rules above.	<i>Guess the Word</i> presentation < <a href="https://www.canva.com/design/DAGDHoVH4pE/grXI-Wy1K0IJ_2Ukbxqs8A/view?utm_content=DAGDHoVH4pE&amp;utm_campaign=designshare&amp;utm_medium=link&amp;utm_source=editor">https://www.canva.com/design/DAGDHoVH4pE/grXI-Wy1K0IJ_2Ukbxqs8A/view?utm_content=DAGDHoVH4pE&amp;utm_campaign=designshare&amp;utm_medium=link&amp;utm_source=editor</a> >, whiteboards and markers	mice, flood, cockroach, soil, bear, landscape, shark, wildlife, valley, creepy, rotten, cute, deadly

SESSION 3			
Time	Activity	Materials	Contents
15'	<p>- Erase the board and divide it in half along with the class in order to play another game called <i>Tag</i>, in which one student from each half of the class volunteers to come up to the blackboard and write as many related words to a given item as possible during 30 seconds. Teammates can aid their writers but must do so quietly so that the other team doesn't steal the words as well. Each related word is worth 1 point, and the score is kept on the board under each team.</p> <p>- Play the game <i>Tag</i> following the rules above.</p>	blackboard, chalk, online Google timer	jellyfish, dawn, cold, predator, peak, poacher, sunset

SESSION 3			
Time	Activity	Materials	Contents
15'	<ul style="list-style-type: none"> <li>- Instruct students to pull out their electronic devices and hand out anonymous individual codes to each student. Project the <i>Kahoot!</i> codes for them to enter the game using the provided anonymous codes, and explain that students will review the vocabulary they have learned in the <i>Kahoot!</i> quiz.</li> <li>- Explain that they will be shown a sentence with a gap, which they must complete by selecting one of the four answers provided; there is only one grammatically and semantically correct answer per item.</li> <li>- Play the game, stopping after each item in order to resolve any doubts.</li> <li>- Review results together and ask about possible difficulties students may have.</li> </ul>	<p>anonymous individual codes for students, <i>Kahoot!</i> questionnaire</p> <p>&lt;<a href="https://play.kahoot.it/v2/?quizId=46c41fd3-8ea6-49d4-b948-b68bcbe04896&amp;hostId=5b6983aa-edea-459e-a1f8-af82a33a6f8c">https://play.kahoot.it/v2/?quizId=46c41fd3-8ea6-49d4-b948-b68bcbe04896&amp;hostId=5b6983aa-edea-459e-a1f8-af82a33a6f8c</a>&gt;, electronic devices</p>	<p>jellyfish, dawn, cold, predators, peak, poachers, sunset, sharks, bear, landscape, soil, mice, valley, wildlife</p>
2'	<ul style="list-style-type: none"> <li>- Collect individual codes, resolve questions and thank students for their participation.</li> </ul>	-	-

**Table 4***Sequence of activities in session 4*

<b>SESSION 4</b>			
<b>Time</b>	<b>Activity</b>	<b>Materials</b>	<b>Contents</b>
3'	- Greet students and introduce the session's topic: learn about impressive natural facts and play a game to review the passive voice.	-	-
10'	- Divide the class in ten teams and assign one impressive fact to each of them; teams must choose the correct vocabulary items to complete the sentences out of a binary option. - Review and correct the sentences together, going over any issues encountered during the exercise.	Book p. 80 (Figure 8)	fierce, predators, deadly, dry up, wiped out, rare, native, poachers, wilderness, prey, tidal wave, reef, land, species, dawn, rise, cool down, rough, bushes, peaks, landscape, soil
10'	- Briefly review the passive voice by asking volunteers to transform active sentences into passive ones. This structure had been previously taught and reviewed by the permanent teacher.	Active and passive sentences presentation < <a href="https://www.canva.com/design/DAGCqCqYVDQ/3wqKQQqQLCgK1PL_FM9YH/A/view?utm_content=DAGCqCqYVDQ&amp;utm_campaign=designshare&amp;utm_medium=link&amp;utm_source=editor">https://www.canva.com/design/DAGCqCqYVDQ/3wqKQQqQLCgK1PL_FM9YH/A/view?utm_content=DAGCqCqYVDQ&amp;utm_campaign=designshare&amp;utm_medium=link&amp;utm_source=editor</a> >, computer, touchscreen	passive voice

SESSION 4			
Time	Activity	Materials	Contents
25'	<p>- Divide the class in small teams and explain the rules of the game <i>Architect</i>. students are given a set of flashcards with nouns, verbs, functors and other sentence constituents, which they must use to create full sentences using the passive voice. Each time that a team has produced a sentence, they must raise their hand and call <i>Architect</i> so that the teacher can verify whether it's correct. If it is, they must write it down on a piece of paper. If it isn't, they must keep working on it until the sentence is correct. Each correct sentence is worth one point, and the score is tallied up on the board under each team.</p> <p>- Play the game, making sure to address the difficulties encountered by each team as they arise.</p>	<p><i>Architect</i> flashcards (Figure 5), blackboard, sheets of paper</p>	<p>passive voice, tidal wave, reef, land, species, dinosaurs, snakes, asteroid, cause, wipe out, bite</p>
2'	<p>- Collect <i>Architect</i> team sheets, resolve questions and thank students for their participation.</p>	-	-

**Table 5***Sequence of activities in session 5*

SESSION 5			
Time	Activity	Materials	Contents
10'	<ul style="list-style-type: none"> <li>- Greet students and introduce the session's topic: carrying out a written test to evaluate their reading comprehension and knowledge of grammar and vocabulary with respect to the contents explored in unit 6 <i>Extreme Nature</i>.</li> <li>- Ask students to sit individually and clear their desks, then hand out the written tests.</li> <li>- Go over the questions together and resolve any issues that may come up.</li> </ul>	-	-
40'	<ul style="list-style-type: none"> <li>- Instruct students to carry out their written tests in silence.</li> </ul>	Written test (Figure 16)	Unit 6 reading, grammar and vocabulary exercises

### 3. Data

#### 3.1 Data processing

After completing data collection from the *Kahoot!* questionnaire, I downloaded the results from the online platform and processed them on the R programming environment (R Core Team, 2019). More specifically, I extracted the values corresponding to the response times and accuracy of responses per trial and participant—these were the dependent variables. Response times below 200 ms were removed from the data due to the impossibility of these reflecting decision-making language-related processes; these deleted values corresponded to less than 1% of the data. The independent variable was priming condition, which had two levels: (i) lexical priming and (ii) visual priming, corresponding to the two modalities of priming used in the quiz (see section 2.5 for a full account of the *Kahoot!* questionnaire procedure).

After completing data collection from the written test, I corrected the exercises individually and created a data frame to enter the data. After the exercises had been graded, I added a sticker to each test with the anonymous individual code that each student who had decided to participate in the study had been assigned. Once the individual codes had been entered into the data frame, I also entered an accuracy value ranging from 0 to 4 per learning condition. These corresponded to the different levels of the independent variable, i.e. learning condition, considered in the written test: (i) lexical priming, containing vocabulary items that had been taught mainly through lexical priming and game-based methods; (ii) visual priming, containing vocabulary items that had been taught mainly through visual priming and game-based methods; and (iii) game-based methods, containing vocabulary items that had been taught mainly through game-based methods alone. The accuracy value (0-4) depended on how many vocabulary items belonging to that condition the student had correctly used and spelled in the written test. This data frame was also processed on the R programming environment (R Core Team, 2019). For more information on the written test procedure, see section 2.5.

### 3.2 Data analysis

For the *Kahoot!* data, I created two linear mixed models to analyze the raw response time values and accuracy values, including *priming condition* as the independent variable and using the *lme4* package (Bates, Mächler, Bolker & Walker, 2015) in the R programming environment (R Core Team, 2019). Treatment contrasts were defined for the independent variable, and the lexical priming condition coded as the reference level. In each model, either raw response time values or accuracy values were modeled as a function of *priming condition*, including varying intercepts by participant and by trial: *raw response time values/accuracy values ~ priming condition + (1 | participant) + (1 | item)*. All *p*-values were calculated using the *lmerTest* package (Kuznetsova, Brockhoff & Christensen, 2017), and significance levels are set at the  $p < 0.05$  value.

For the written test data, I created a linear mixed model to analyze the obtained accuracy values, including *learning condition* as the independent variable and using the *lme4* package (Bates et al., 2015) in the R programming environment (R Core Team, 2019). Treatment contrasts were defined for the independent variable, and the lexical priming condition coded as the reference level. In the final model, accuracy values were modeled as a function of *learning condition*, including varying intercepts by participant and by trial: *accuracy values ~ learning condition + (1 | participant) + (1 | item)*. All *p*-values were calculated using the *lmerTest* package (Kuznetsova et al., 2017), and significance levels are set at the  $p < 0.05$  value.

## 4. Results and discussion

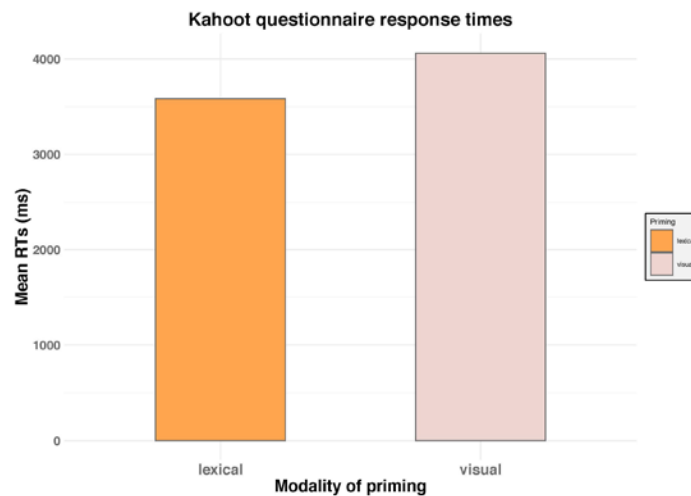
In this section, I will explore the obtained results in relation to the research questions and hypotheses formulated in section 2.2. More specifically, I will address the question of whether any modality of priming displayed a facilitatory effect compared to the other (RQ2) in vocabulary selection in the *Kahoot!* quiz by interpreting the results obtained from analyzing two dependent variables in the data: response times and accuracy. Subsequently, I will also address the question of whether employing different learning conditions had any mid-term impact in the students' performance in the vocabulary exercises of the written test (RQ1). For a complete account of the research questions and hypotheses entertained in this study, see section 2.2.

### 4.1 Kahoot! questionnaire results

Results are summarized in Figures 1 and 2, showing mean response times and mean accuracy of responses in the *Kahoot!* quiz, respectively. The summary of the coefficients of the response times model is provided in Table 6. Results from the linear mixed model showed a significant main effect of priming condition, indicating that the modality of priming used did have an impact in participants' response times, as responses for the lexical priming condition were faster than for the visual priming condition. The summary of the coefficients of the accuracy model is provided in Table 7. Results from the linear mixed model showed no significant main effect of priming condition, indicating that the modality of priming used did not have an impact in participants' accuracy of responses.

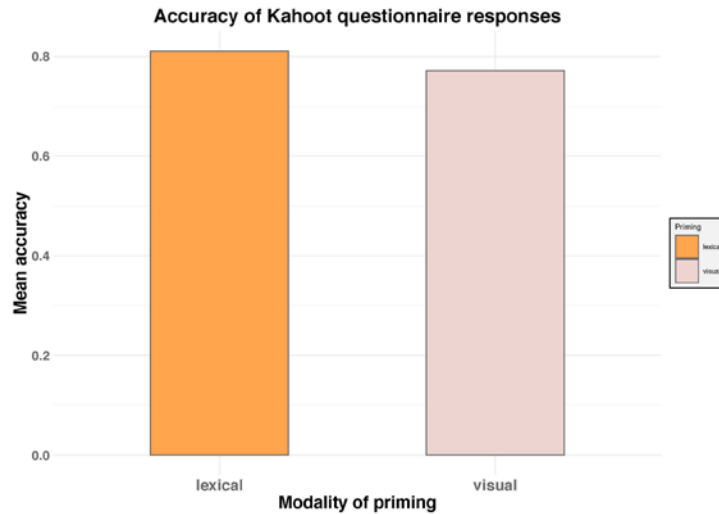
**Figure 1**

*Mean response times in the Kahoot! questionnaire*



**Figure 2**

*Mean accuracy of responses in the Kahoot! questionnaire*

**Table 6**

*Summary of the coefficients from the response times linear mixed model in the Kahoot! questionnaire*

	Estimate	SE	<i>t</i> -value	<i>p</i> -value
(Intercept)	3585.368	171.800	20.869	<0.001
Visual priming	475.726	200.975	2.367	0.018

**Table 7**

*Summary of the coefficients from the accuracy of responses linear mixed model in the Kahoot! questionnaire*

	Estimate	SE	<i>t</i> -value	<i>p</i> -value
(Intercept)	1.602	0.208	7.721	<0.001
Visual priming	-0.252	0.219	-1.150	0.25

These results indicate that students were able to select the correct items more quickly whenever they were presented by means of lexical priming in the *Kahoot!* quiz compared to the visual priming condition, thus modulating the speed of their vocabulary selection. By contrast, the modality of priming had no effect in the accuracy of the students' responses, as no main effect was found in this regard. Taken together, these results indicate that lexical priming may present a facilitatory effect in the speed of vocabulary selection in a task such as a *Kahoot!* questionnaire, but no

facilitatory effect with respect to the accuracy of responses. However, it should be noted that the procedure regarding stimuli presentation may have impacted these results, as the software allowed for the previsualization of the gapped sentence during 10 seconds prior to displaying the four possible answers in the lexical priming condition, but did not allow for the previsualization of the related image during that period of time in the visual priming condition. For these reasons, it could be possible that the differences in response times may be due to the earlier availability of the lexical cues in the lexical priming condition, compared to the later availability of the visual cues in the visual priming condition.

## 4.2 Written test results

Results are summarized in Figure 3, showing mean accuracy of responses in the vocabulary exercises of the written test. The summary of the coefficients of the accuracy model is provided in Table 8. Results from the linear mixed model showed a significant main effect of learning condition, indicating that the modality of learning used did have an impact in participants' accuracy of responses, as responses for the lexical priming and visual priming condition displayed significantly higher values than those corresponding to the game-based methods condition.

**Figure 3**

*Mean accuracy of responses in the written test*



**Table 8**

*Summary of the coefficients from the accuracy of responses linear mixed model in the written test*

	Estimate	SE	t-value	p-value
(Intercept)	3.051	0.184	62.414	<0.001
Visual priming + game-based methods	0.026	0.151	78.000	0.866
Game-based methods	-0.436	0.151	78.000	0.005

These results indicate that students were able to select the correct vocabulary items more often whenever these had been previously presented mainly by means of lexical or visual priming paired with game-based methods compared to those items which had been presented mainly by means of game-based methods alone. Thus, results show that the learning condition did modulate the accuracy of students' responses in the written test, which suggests that the pairing of priming techniques together with game-based methods seems to facilitate learning of L2 nouns more than the use of game-based methods alone.

Taken together, results from the *Kahoot!* questionnaire and the written test lend support to H2 considered in section 2.2. In essence, these findings indicate that vocabulary items which were taught through priming techniques (i.e., visual and lexical priming) together with game-based methods showed higher accuracy values in the written test results compared to those items that were not taught through priming techniques but used game-based methods alone. This suggests that priming techniques combined with game-based methods were more effective in short-term and mid-term L2 noun learning than game-based methods in isolation.

## **5. Conclusions and pedagogical implications**

This Master Thesis presents findings from a five-session pedagogical intervention that was implemented with 1<sup>st</sup> level Baccalaureate students belonging to a public secondary school in Spain. The study focused on the teaching and learning of L2 vocabulary in the ELT classroom, and it had two main goals: (a) providing a pedagogical intervention that was appropriate to the curricular and timing requirements, as well as to the students' level of English, academic profiles and observed classroom dynamics; and (b) exploring the short-term and mid-term effectiveness of different methodologies employed throughout the sessions. Regarding this, three learning conditions were included in the study: (i) the use of game-based methods alongside lexical priming techniques; (ii) the use of game-based methods alongside visual priming techniques; and (iii) the use game-based methods in isolation (see Table 9 of Appendix A for a summary of the learning conditions). These methodologies were included in the study due to their facilitatory effects in

students' learning outcomes. Several research questions and hypotheses were formulated and considered in order to meet one of the main goals of this study, that is, exploring the efficacy of the different learning conditions on the teaching and learning of the target vocabulary on behalf of the students. In order to address these questions, two research instruments were used to gather data relative to the students' response times and accuracy in different vocabulary tasks.

Firstly, it was found that the different modalities of priming (i.e., lexical and visual) used in the online *Kahoot!* quiz had no impact on students' accuracy of responses in a fill-in-the-gap exercise with the target vocabulary and gapped sentences. It did, however, have a significant impact in the speed of students' response times, since students were quicker to select the correct answer in the lexical priming condition compared to the visual priming condition. This is an interesting result that could reveal the processing availability of different cognitive mechanisms contingent on stimuli perception strategies, although it could also be due to the difference in stimuli presentation between conditions. This is because the gapped sentence containing the lexical priming information was previsualized during 10 seconds in the lexical priming condition, but the visual prime was not previsualized at all in the visual priming condition; this difference was solely due to the presentation settings available in the *Kahoot!* platform (Versvik, Brand & Brooker, 2012). In any case, future research is needed to determine the existence, source and scope of this processing difference in order to explore the potential pedagogical advantages of using one modality of priming over the other in educational settings.

Secondly, it was found that the different learning conditions, (i.e., lexical priming and game-based methods, visual priming and game-based methods, and game-based methods alone) had a significant impact on students' accuracy of responses in the vocabulary exercises of a written test carried out at the end of the pedagogical intervention. In other words, the three learning conditions employed throughout the sessions produced significant differences in the learning outcomes of the students, as both lexical and visual priming techniques paired with game-based methods correlated with higher accuracy values than game-based methods used in isolation. This suggests that priming techniques combined with game-based methods could be more effective than other methodologies in the teaching and learning of L2 vocabulary in ELT contexts. However, further research is necessary to determine the robustness of the effect reported here, as well as other appropriate possibilities in applying priming and game-based methods to the teaching of L2 vocabulary items. These results aim to contribute new relevant findings to current pedagogical discussions regarding the efficacy of different techniques and tools for teaching vocabulary in the ELT classroom, thus fulfilling one of the main goals of this study.

Finally, this study also aimed to provide a pedagogical intervention that was generally appropriate for most English courses of 1<sup>st</sup> Baccaalaureate level studies, making the intervention not only educational, but also motivating and enjoyable for the students. In this regard, the intervention was met with positivity and enthusiasm on behalf of most of the students, and game-based activities in general were the highlight of each session. In my opinion, both of the groups in which this intervention was carried out positively benefited from its application, as they orally manifested enjoying the sessions and feeling confident and prepared for the written test. However, I also encountered a number of difficulties while teaching the sessions, most of which can be attributed to the fact that I lacked in-depth knowledge of the students (both individually and as a group, as well as personally and academically), which limited the ways in which I could choose to grab their attention, manage the classroom and set the appropriate tone throughout the sessions. Additionally, my own lack of experience as a teacher played a significant role in this respect, as this was my first experience in teaching in groups belonging to 1<sup>st</sup> Baccaalaureate level studies in a public school. Despite these difficulties, I believe that my role as an educator during the design and application of this pedagogical intervention was satisfactory, although future experience and practical knowledge in pedagogy is needed to continue to progress in my professional career as an ELT teacher.

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## Appendix A

**Table 9**

*Learning conditions employed in the exploration of the target vocabulary*

	Condition A	Condition B	Condition C
Methods	Lexical priming and game-based methods	Visual priming and game-based methods	Game-based methods

**Table 10**

*Target L2 nouns in relation to the main learning condition through which they were explored throughout the sessions*

	Lexical priming and game-based methods	Visual priming and game-based methods	Game-based methods
Target L2 nouns	jellyfish dawn poacher peak cold predator sunset	soil shark mice wildlife bear landscape valley	tidal wave reef land species

**Table 11**

*Kahoot! questionnaire including gapped sentences, available answers and correct answers in relation to the priming condition and prime item used*

Trial number	Gapped sentence	Available answers	Correct answer	Priming condition	Prime
1	There were a lot of ____ at the beach that day.	wildlife valleys water jellyfish	jellyfish	lexical	beach

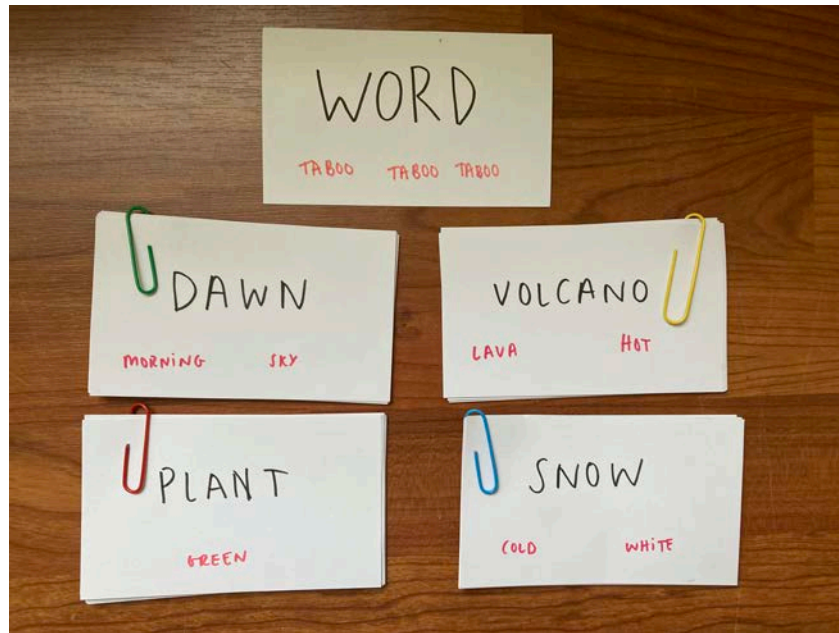
Trial number	Gapped sentence	Available answers	Correct answer	Priming condition	Prime
2	I like to get up early in the morning to see the ____.	dawn sunset creepy rise	dawn	lexical	morning
3	Penguins live in Antarctica, which means they must tolerate the ____ really well.	heat poachers cold frozen	cold	lexical	Antarctica
4	Lions are considered to be great ____.	prey predators poachers wilderness	predators	lexical	lions
5	The highest ____ in Mount Everest is at approximately 8,848 meters above sea level.	landscapes valley mountains peak	peak	lexical	Mount Everest
6	Did you know that white rhinos almost became extinct because they were hunted by ____?	poachers predator prey wildlife	poachers	lexical	white rhinos
7	Last summer me and my friends watched the ____ every afternoon before going home.	rare sunset sunrise fall	sunset	lexical	afternoon
8	Did you know that ____ are among the oldest animals in the planet?	dolphin ocean waves sharks	sharks	visual	Figure 9
9	It's impossible for a human to win a fight against a ____ without help.	bear beer bore pull	bear	visual	Figure 10

Trial number	Gapped sentence	Available answers	Correct answer	Priming condition	Prime
10	The ___ at my favorite spot is absolutely beautiful, especially at sunset.	sunrise hot landscape poachers	landscape	visual	Figure 11
11	If you want to grow tomatoes, you will need some ___, water and a lot of sunlight.	Earth soil soy waves	soil	visual	Figure 12
12	My grandma's house has ___ in it, so I'm scared to go to the bathroom at night.	fearsome creepy mice mouse	mice	visual	Figure 13
13	Most people from Europe go to African countries to see its ___ in person.	wildlife mouse predator jellyfish	wildlife	visual	Figure 14
14	Society of the Snow tells the story of young men who are trapped in a ___ in the Andes Mountains.	peaks valley cold wilderness	valley	visual	Figure 15

## Appendix B

**Figure 4**

*Picture of the Taboo cards used in session 1*



**Figure 5**

*Picture of the Architect flashcards used in session 4*

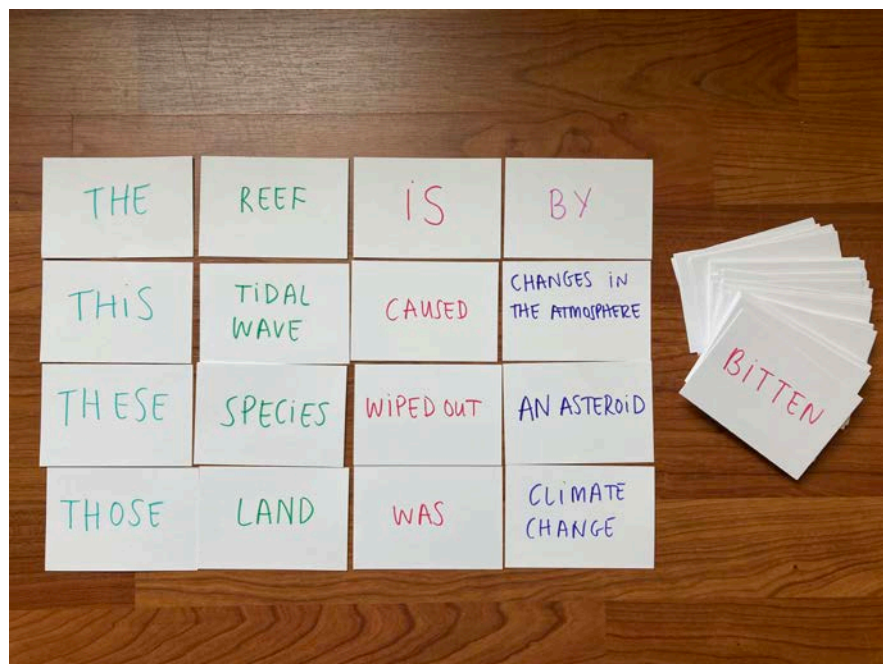

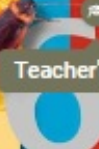


Figure 6

Page 83 of the English course textbook



# Trenton Museum of Natural History



Teacher's

▶ UPCOMING EXHIBITION:

## The Ugly, the Fierce and the Deadly

Opening 2nd March

This year, millions of dollars will be donated in order to protect nature's flagship species, the animals which we love to help. They include everything from orangutans and tigers, to lions and polar bears. Why do we enjoy helping these animals in particular? One of the traits shared by all of them is cuteness. As zoologist Nathan Yuussy said, "... the more baby-like an animal is, the more we want to save it. Big eyes, round heads and short snouts are all characteristics that set off the "cute" response." Humans are programmed to protect cuteness, and cute animals create a feeling in us similar to that which is created by human babies. We also like animals that are similar to us physically or behaviourally, or that seem to possess admirable characteristics like bravery or loyalty. For example, like humans, chimpanzees use tools, which causes us to feel an affinity for them.

But what about the rest of nature? The wilderness is full of animals and insects which are either ugly or simply terrifying. The idea of living in a world free of some of these creatures might seem appealing, but at *The Ugly, the Fierce and the Deadly*, you will find out just what our planet would be like without some of your least favourite creatures.

### Exhibit 1: Underwater Monsters?

Sharks have swum in the oceans for more than 400 million years. These fearsome predators survived the Great Dying, which wiped out most life on our planet, including 96% of Earth's marine species 252 million years ago. Tragically, humans might be the ones to put an end to that extended reign. Although shark fishing is illegal in many countries, an estimated 100 million sharks are still killed every year, and a decline of up to 80% in shark populations has been reported globally. So what would the world be like if sharks disappeared? The answer is almost beyond comprehension. To begin with, around 50% of the carbon in the world is stored in our oceans, mainly in marine plant life. Without sharks, fish populations would grow, and the resulting overconsumption of marine plants would release a flood of carbon into the atmosphere, a primary culprit in global warming.

### Exhibit 2: Creepy Creatures

If you're like most people, the sight of a cockroach probably makes you scream. However, as disgusting as you might think they are, cockroaches play a vital role in nature. Birds and small mammals like mice and rats feed on these insects, so if cockroaches were wiped out, the number of small mammals would decline. Most people wouldn't object to having fewer mice and rats in the world, but the animals that prey on mice and rats would suffer, too. In addition, the soil would be affected by the extinction of cockroaches. Many species eat rotten leaves and plants, which trap a large quantity of nitrogen in the cockroaches' bodies. This nitrogen is later released into the soil, where it is absorbed by plants. Without cockroaches, our forests might not survive.

Come to the exhibition and find out more about these and other creatures.  
Monday-Friday, 9 am to 6 pm

### MIND YOUR LANGUAGE

1 The word *like* can be used:

- as a verb
- to introduce examples
- to say that things are similar

Find an example of each use in paragraph 1 of the text. What other uses of *like* do you know?

### PRONUNCIATION

2 Listen and repeat the words from the text.  
disappear /ɪə/ share /eə/

3 Which word doesn't belong? Listen and check your answers.

1 /ɪə/ year fearsome atmosphere where  
2 /eə/ fair here bear care

Pronunciation Practice: page 145

Workbook ▶

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Figure 7

Page 82 of the English course textbook

Teacher's C

**READING Promotional Material**

1 The keywords below come from the text. What do you think the text is about?  
protect ■ ugly ■ terrifying ■ wiped out  
decline ■ overconsumption

2 Read the museum brochure and check your answer.

3 Choose the correct answer.

1 What have lions and polar bears got in common?  
a their habitat  
b their appeal  
c their behaviour  
d their endangered status

2 Our reaction to cuteness is ...  
a something we are born with  
b learned behaviour  
c the result of our similarity to animals  
d caused by human babies

3 The Great Dying refers to ...  
a the extinction of most of our planet's life forms  
b the extinction of most of the ocean's life forms  
c the appearance of sharks  
d a man-made disaster

4 What would happen if large amounts of ocean plants were eaten by fish?  
a The fish would die out.  
b The plants would become extinct.  
c There wouldn't be enough carbon in the ocean.  
d Global warming would increase.

5 Cockroaches help plants grow because they ...  
a are eaten by rodents  
b eat nitrogen  
c reintroduce nitrogen into the soil  
d clean the forest floor

4 Answer the questions in your own words.

1 Which physical characteristics do humans respond positively to?  
2 Why does the writer include the example of chimpanzees?  
3 What has happened to the global shark population in recent years?  
4 How would the disappearance of cockroaches affect larger predators?

**STRETCH YOUR MIND**  
Critical Thinking  
In your opinion, what is the most important function of a museum?

**WORDS FROM THE TEXT**

5 Find words or expressions in the text that mean:  
1 extremely frightening (lines 9-12)  
2 cause to stop (lines 13-18)  
3 first of all (lines 23-30)  
4 have a part in (lines 31-37)  
5 let go (lines 40-45)

6 Complete the sentences with the words below. Make any necessary changes.  
object ■ bravery ■ beyond ■ rotten ■ admirable  
trap ■ decline  
1 Her ... was rewarded with a medal.  
2 Thanks to improved safety measures, there has been a ... in the number of accidents.  
3 Her work for the environment was truly ...  
4 Climbing Mt. Everest is ... the ability of most people.  
5 This meat smells - I'm sure it's ...  
6 If everyone ... to the sale of fur, fewer animals would be killed by poachers.  
7 When a lake freezes, fish are ... beneath the ice.

**NEGATIVE PREFIXES**  
The prefixes *dis-*, *il-*, *im-*, *in-*, *ir-* and *un-* are used to form the opposite of a word and usually give it a negative meaning.  
Look in lines 15-25 and find two examples.  
Grammar Appendix Workbook page 120

7 Add the correct negative prefix to the words below and complete the sentences.  
connect ■ responsible ■ patient ■ active  
logical ■ approve ■ visible ■ predictable  
1 The octopus uses camouflage to make itself ... to other animals.  
2 My phone will ... from the Wi-Fi if I stand in this corner.  
3 It's ... to buy a pet if you can't take care of it properly.  
4 Zoo animals need exercise. If they are ..., they may become ill.  
5 After we had waited for over an hour, we began to get ...  
6 They won't win their argument in favour of hunting because their statements are ...  
7 Animal conservationists ... of hunting because it may disturb the balance of nature.  
8 Scientists can't tell when a volcano will erupt. They're ...






Figure 8

Page 82 of the English course textbook

**VOCABULARY** The Natural World


  
Teacher's C





**VOCABULARY IN CONTEXT**


**1** Read the statements about the natural world and choose the correct answers. Pay attention to the words in colour.

Answers, page 92

**BELIEVE IT OR NOT!**

- 1 There are many **fierce** and dangerous **predators** in the ocean, but none is as **deadly** as the **box jellyfish** / **great white shark**. One dose of its venom can kill 60 people.
- 2 Due to the **summer heat** / **volcanic activity**, the Lost Lake in Oregon, USA, disappears once a year, leaving the land around it to **dry up**.
- 3 In the late 1890s, a single **cat** / **snake** **wiped out** a **rare** species of bird **native** to an island near New Zealand, proving that invasive species can be more dangerous to wildlife than **poachers**.
- 4 In the winter of 2017, Aleksandr Kovalev survived for **two weeks** / **a month** in the extreme cold of the Siberian **wilderness**. He didn't have food or water and was easy **prey** for the many bears that inhabit the area.
- 5 The ocean **tides** are the result of the **sun's** / **moon's** gravitational pull. However, despite the fact that humans are between 50% to 75% water, this pull hasn't been proven to affect us.
- 6 Birds sing most **loudly** / **quietly** at **dawn** and become **quieter** / **noisier** once the temperature **rises**.
- 7 The Earth's axis is **tilted** / **parallel** to the sun. Throughout the year, one part of the planet gets the sun's direct rays, while the weather **cools down** in the other parts.
- 8 The Bay of Biscay, located between Spain and **France** / **England**, is one of the most dangerous areas of the world. The ocean is often very **rough** there because it experiences strong winds and huge waves.
- 9 There are no **bushes** or trees on high mountain **peaks** due to the **high altitude** / **low temperatures**. However, certain types of grass and flowers can grow in this **landscape**.
- 10 One **handful** / **kilogram** of **soil** contains more living organisms than there are people on the planet.



**MIND YOUR LANGUAGE**

Watch out for the following commonly confused words:

**soil** - a mixture of sand and organic material in which plants grow

**land** - the part of Earth that is not covered by water

**Note** - *Earth* is the name of our planet; *earth* is a synonym for *soil*.

**2** Complete the sentences with the words below.

wilderness ■ cools down ■ deadly ■ dry up  
dawn ■ poachers

- 1 Most reptiles aren't dangerous, but a snake bite can be ...
- 2 ... is a special time of day, but many people sleep too late to appreciate it.
- 3 The rhinoceros is endangered because ... hunt it for its horn.
- 4 The lack of rain can cause lakes and rivers to ... and disappear.
- 5 The desert is hot during the day, but it ... in the evening.
- 6 The ... is disappearing because builders are developing it.

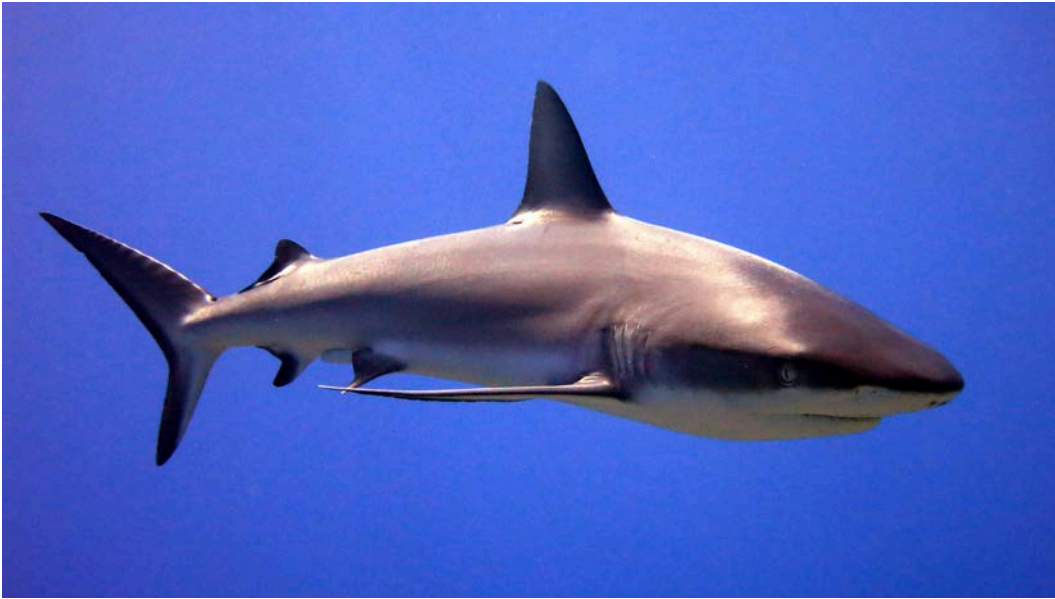
**3** Replace the words or phrases in bold with a word that has a similar meaning or an expression in colour from Exercise 1.

- 1 This butterfly is extremely **unusual**.
- 2 Some spiders catch their victims in **webs**.
- 3 Wolves are one of the **naturally occurring** species of Western Europe.
- 4 The water in the tank **reaches a higher level** when it rains.
- 5 Lions are **powerful** hunters.
- 6 The **countryside** is really beautiful here.

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**Figure 9**

*Visual prime used in trial 8 of the Kahoot! quiz*

**Figure 10**

*Visual prime used in trial 9 of the Kahoot! quiz*



**Figure 11**

*Visual prime used in trial 10 of the Kahoot! quiz*

**Figure 12**

*Visual prime used in trial 11 of the Kahoot! quiz*



**Figure 13**

*Visual prime used in trial 12 of the Kahoot! quiz*

**Figure 14**

*Visual prime used in trial 13 of the Kahoot! quiz*



**Figure 15**

*Visual prime used in trial 14 of the Kahoot! quiz*



## Appendix C

### Figure 16

Vocabulary exercises in written test; answers are indicated in red

#### VOCABULARY (1.5 pts)

1. Choose the right word from the box to complete the following sentences (1.2 pts).

Creepy – Rotten – Tidal waves – Soil – Land – Dawn – Peak  
Great white sharks – Poachers – Jellyfish – Wildlife – Reefs

- a. Coral reefs are some of the most fragile ecosystems in the world.
- b. Whales and great white sharks are both marine animals.
- c. Did you know that just one sting of a box jellyfish can kill you?
- d. In the summer, I like to get up really early to see the dawn from the beach. It's so beautiful!
- e. Eating rotten food can bring about stomach aches.
- f. Plants need fertile soil to grow.
- g. After a long flight of looking out of the plane window and seeing the ocean, she finally saw land and a very high peak covered in snow.
- h. I think I might have seen a ghost last night... It was so creepy!
- i. Poachers, who hunt protected species to sell in the black market, are having a very negative impact on wildlife protection.
- j. Tidal waves are not very common here, but some Asian countries have to deal with the destruction they cause on a regular basis.

2. Write the plural form of the following words (0.3 pts).

Jellyfish: jellyfish

Mouse: mice

Species: species

## Figure 17

*Document showing the Ethical Committee's approval of this study*



VICERREITORÍA DE INVESTIGACIÓN  
E INNOVACIÓN  
Oficina de Investigación e Tecnoloxía  
Edificio CACTUS – Campus de Lugo  
27002 Lugo  
Tel. 982 822 851  
Correo electrónico: [comité.bioetica@usc.es](mailto:comité.bioetica@usc.es)

Visto o informe realizado por D./Da **José Eugenio Rodríguez Fernández**, responsable do **Comité de Ética da Facultade de Ciencias da Educación (Campus Santiago)**, órgano responsable da revisión e informe previo das propostas de traballos académicos do tipo proxecto de investigación e/ou intervención con seres humanos, as súas mostras e os seus datos das titulacións adscritas a este Centro en canto o cumprimento das condicións e requisitos esixidos para ser informado favorablemente polo Comité de Bioética da USC

O Comité de Bioética da USC da o visto e praxe a proposta titulada **“The impact of priming methods on L2 noun learning: A case study through a competitive game in ELT”** presentada por D./Da. **Beatriz Gómez Vidal**, baixo a titorización de D./Da. **Ignacio Miguel Palacios Martínez**.

Lugo, 2 de maio de 2024

O Presidente do Comité de Bioética da USC

CIFUENTES MARTINEZ  
JOSE MANUEL -  
02198348P

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CIFUENTES MARTINEZ JOSE  
MANUEL - 02198348P  
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Asdo. J. Manuel Cifuentes Martínez

## Figure 18

### *Informed consent paperwork*



#### CONSENTIMIENTO INFORMADO

##### Proxecto de investigación

*The impact of priming methods on L2 noun learning: A case study through a competitive game in ELT*

Autora: Beatriz Gómez Vidal

Profesor titor: Ignacio Miguel Palacios Martínez

Facultade de Ciencias da Educación, Universidade de Santiago de Compostela

Contacto: beatriz.gomez.vidal@rat.usc.es

##### Resumo do estudo

No marco do Máster Universitario en Profesorado de Educación Secundaria Obligatoria e Bacharelato, Formación Profesional e Ensinanzas de Idiomas (Especialidade Linguas e Literaturas), a presente proposta educativa forma parte dun Traballo de Fin de Máster que ten como finalidade (a) facilitar a aprendizaxe de léxico en lingua inglesa a través dun cuestionario lúdico en liña, a (b) coñecer o impacto das técnicas de preactivación na aprendizaxe do mesmo para a contribución ao coñecemento científico sobre a eficacia destas intervencións didácticas.

##### Metodoloxía

O cuestionario en liña realizarase na plataforma dixital *Kahoot!* en < <https://kahoot.com/> mediante o uso dun aparello electrónico dispoñible no centro educativo. O alumnado non introducirá ningún tipo de dato ou resposta persoal na aplicación, xa que empregará un código asignado aleatoriamente antes do inicio como identificador para garantir o seu anonimato (ex. s01, s02, s03...).

##### Participación

A participación é voluntaria e altruísta. Non recibirás remuneración nin beneficio directo pola participación neste estudo. O/A participante ten dereito a non participar e/ou abandonar en calquera momento, sen supor estas accións ningún prexuízo ou medida na súa contra.

##### Datos

De acordo co Regulamento UE 2016/679 e a Lei Orgánica 3/2018, os datos que se obteñan serán utilizados unicamente para o Traballo de Fin de Máster no Máster Universitario en Profesorado de Educación Secundaria Obligatoria e Bacharelato, Formación Profesional e Ensinanzas de Idiomas (Especialidade Linguas e Literaturas) da Universidade de Santiago de Compostela (USC), e conservaranse unicamente durante o tempo necesario para cumprir co devandito propósito. O/A participante ten dereito a contactar coa autora do traballo mediante correo electrónico para facer efectiva a revogación e dereito a elixir sobre os datos obtidos (i.e. conservación ou destrución). Os datos manexados serán tratados de forma confidencial e non se revelará a identidade dos/as participantes en ningún momento. Unha vez realizada a actividade e descargados os datos da plataforma dixital, estes serán eliminados permanentemente da mesma. A única copia dixital dos datos será custodiada polo profesor titor Ignacio Miguel Palacios Martínez.



Podes consultar a política de privacidade e protección de datos da USC en <<http://www.usc.es/gli/normativa/protecciondatos/index.html>>.

O/A participante terá dereito a coñecer os resultados xerais do estudo a través da solicitude á autora do mesmo mediante correo electrónico.

Para máis información, por favor dirixirse á dirección de contacto da autora Beatriz Gómez Vidal.

Confirmo que lín e entendín a información precedente e consinto en participar no estudo arriba indicado.

Dou o meu consentimento para o tratamento dos datos proporcionados de acordo coa lexislación vivente.

O/A participante,

Data:

Sinatura:

Nome:

A autora do Traballo que recada o consentimento,





Data:

Sinatura:

Nome:

Figure 19

## General guidelines for conducting research provided by the USC

  <p>Reunida a Comisión de valoración de investigacións, prevista na cláusula terceira do Convenio de colaboración entra a Consellería de Cultura, Educación, Formación Profesional e Universidades e a Universidade de Santiago de Compostela, a través do Instituto de Ciencias da Educación, para colaboración en materia de investigación e de comportamento ético, e integrada por investigadores das tres universidades públicas de Galicia e da consellería competente en materia de educación, en sesión ordinaria o día 19 de decembro de 2023, ao respecto da valoración das solicitudes realizadas ao abeiro da Instrución 4/2023 da Secretaría Xeral Técnica da Consellería de Cultura, Educación, Formación Profesional e Universidades para a autorización de realización de estudos no ámbito educativo,</p> <p>ACORDA:</p> <p>1. Que todos os traballos que impliquen recollida de datos no marco de materias curriculares teñan a consideración de traballos académicos e non precisen de valoración por parte desta Comisión. Recómendase que contan coa autorización da Secretaría Xeral da universidade correspondente e, unha vez obtida, poidan realizarse directamente. En ningún caso terán a consideración de investigación polas circunstancias do seu desenvolvemento e os datos recadados non poderán ser utilizados por si mesmos ou de xeito acumulado para unha finalidade distinta da propia da materia como publicación de estudos científicos. Para poder utilizar os datos con esa finalidade deberá realizarse unha proposta de investigación independente e desvinculada da materia que será valorada como tal.</p> <p>2. Que todas as peticións relativas a traballos que impliquen recollida de datos no marco de Traballos de Fin de Grao (TFG) e de Fin de Máster (TFM), aínda que supoñen unha primeira aproximación á cuestión investigadora, non serán considerados como investigacións senón como traballos académicos. Como tales estímase que non precisan da valoración por parte desta Comisión pero deberán contar coa validación do Comité de ética da facultade correspondente. Os datos recadados non poderán ser utilizados por si mesmos ou de xeito acumulado para unha finalidade distinta da propia da materia como publicación de estudos científicos. Para poder utilizar os datos con esa finalidade deberá realizarse unha</p> <p style="text-align: right;">1 de 2</p>	  <p>proposta de investigación independente e desvinculada da materia que será valorada como tal.</p> <p>3. En ámbolos dous casos serán as universidades correspondentes a encargadas de ditas as instrucións oportunas e velar polo cumprimento da normativa vixente (incluída a relativa á protección de datos). Ademais, deberán terse en conta as seguintes consideracións:</p> <ul style="list-style-type: none"> <li>• En todo caso deberá advertir o carácter estritamente voluntario da participación na actividade tanto por parte do equipo docente do centro educativo como do alumnado e as súas familias.</li> <li>• A base lexitimadora para o tratamento que no seu caso se realice de datos de carácter persoal será o consentimento que deberá solicitarse de xeito expreso a todas as persoas que participen. Consentimento que será informado de acordo co establecido no artigo 13 do RXPd, debendo conservarse pola persoa solicitante da autorización os documentos nos que se solicitou o dito consentimento debidamente prestado.</li> <li>• Non será posible pasar formularios nos que non se garante a total anonimidade dos participantes na actividade, de xeito que non recollerán datos que identifiquen ou fagan identificables aos/as participantes.</li> <li>• Manterase o debido deber de sigilo sobre todas aquelas cuestións ás que se teña acceso durante o desenvolvemento dos traballos académicos mencionados.</li> </ul> <p>En Santiago de Compostela, (data na sinatura dixital)</p> <p>A secretaria comisión</p> <p style="text-align: right;">2 de 2</p>
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